DIVISION OF LANDS AND SOIL

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ORIGINAL EFFORTS TO MAP OHIO'S SOILS

The mapping of the soils of Ohio began at the start of the 20th Century. Although originally in the National Weather Bureau, Soil Survey was established by Dr. Milton Whitney in 1899 in the Division of Soils, United States Department of Agriculture (USDA). In 1899, that agency began a soil survey of Montgomery County which was published in 1900. The report had only one named soil, "Miami," with six textural surface phases, plus "Meadow" for the bottom lands. In contrast, the Montgomery County soil survey of 1976 has 38 named soil series. The 1899 survey was a simplistic soil survey but was nevertheless based on scientific field observations. Soil survey work continued in Ohio by the USDA with minimal state participation until 1952. Only one county at a time was being surveyed, and 41 surveys were published with all but one as line maps. The exception was the Fairfield County soil survey maps which were printed on an aerial photographic base in 1951. The Coshocton County survey of 1905 consisted of three named soils. Today, as many as 60 named soil types are in a soil survey report. The science of classifying and naming soil is constantly undergoing change due to continuing research and development of better field techniques.

The modern knowledge of the soils in Ohio began in the early 1920's, with Dr. Guy W. Conrey who is considered the "Father of the Soil Classification System in Ohio." Conrey was a native of Iowa and received his Ph.D. degree in Geology in 1921 from The Ohio State University (OSU) where he had been teaching in the Department of Agronomy since 1917. He was an excellent teacher, and he demonstrated to the people of Ohio the value of soil survey. From the 1920's to the 1940's, Dr. Conrey was in charge of soil survey representing the Ohio Agricultural Experiment Station (OAES). When dressed for the field, he wore black whipcord breeches, black puttees, black whipcord coat, black tie, black cap and was said to "look like a chauffeur for John D. Rockefeller." His name appears on many of the old brown-cover soil reports of that period. Dr. Conrey died in 1948.

Huron County was originally mapped on aerial photographic base maps but was published as line maps without the photo base. Plane tables were used in mapping soils before photo base maps became available. The Madison County soil survey was an early survey, but due to disagreement on the correlation of the soils in the county between federal and state agencies, it was never published.

*Figure 13.1. **John W. Ferguson**, first Chief of the Division of Lands and Soil, 1952-1957.*

The annual budget for Ohio soil survey before activation of the Division was $14,000.

FORMATION OF THE DIVISION

When the General Assembly approved Amended Senate Bill 13 in 1949, it set forth the duties and responsibilities of the Division of Lands and Soil. The General Assembly recognized that soil is a basic natural resource of the state. It also recognized that Ohio should assume a position of leadership in a state program. This Act states in Sections 375-11 and 375-12 the Division "shall cooperate with all agencies engaged in soil conservation work in Ohio; furnish aid and equipment to Ohio soil conservation districts ... [and] shall have authority to assemble information through the medium of any state department or agency or from any other source. The [Division] shall be authorized and directed to study and report on the lands and the natural resources thereof, of the state of Ohio, which are available and suitable for state forests, recreational or scenic parks, wild life preserves or are of scientific, historical or archaeological interest... sanitation and the disposal of waste shall remain vested under existing laws with the state department of health." The purpose and goal of the Division, as defined in a subsequent document, is "to complete as rapidly as possible, an accurate and workable soil and land use inventory of the state, in order that every farmer might have available useable and understandable information that will assist him in planning wise use of his land for its maximum sustained agricultural production and at the same time conserve water and decrease erosion to the irreducible minimum."

The Division of Lands and Soil, last of the seven original Divisions to be organized in ODNR, was activated on 1 April 1952. John W. Ferguson (Fig. 13.1), an engineer and former Soil Conservation Service (SCS), USDA employee, was selected to be the first Division Chief. The first office, which was to be temporary, was located at 553 East Broad Street, Columbus.

During the first year of operation, a delay in getting Civil Service approval of job classification resulted in considerable money being returned to the State at the end of the year. The budget was $37,151 of which only $16,201 was expended. An attempt was made by the Natural Resources Commission at the May 1952 meeting to have the unused funds transferred to the next biennium "to aid in organization and development of the newly activated division," but this effort was unsuccessful. In 1953, Bryce Browning of the Natural Resources Commission asked if the Division could speed up work to complete the state mapping in seven-and-a-half years instead of 15 years as suggested by Chief Ferguson. G. Kenneth Dotson was selected in 1955 as the first Assistant Chief.

During this period, several people laid the groundwork for the long-term, smooth cooperative relations that was to be the Division's heritage: John Slipher, Ohio Cooperative Extension Service (OCES), OSU; Leo L. Rummell, Director, OAES; ODNR Director Marion; H. Howe Morse, State Soil Scientist, SCS, USDA; Dr. Garth Volk, Chair, Agronomy Department, OSU; Dr. Nicholas Holowaychuk, Agronomy Department, OSU; and Chief John Ferguson. Nick Holowaychuk continued a long and close relationship in the state soil survey program in Ohio as the Agronomy Department's representative on field inspections, reviews, and correlations as well as head of the Soil Inventory Laboratory. He was also Chair of the Soil Inventory Board for many

years. His wise counsel was sorely missed when he retired in 1977. He now lives in Edmonton, Alberta, Canada, near his family.

Early employees who greatly influenced the character of the program were John Ferguson, Kenneth Dotson, Francis Baker, Richard Jones, John Scott, Dale Garner, Samuel Bone, Dalton "Red" Touvell, James Petro, William Meyers, James Evans, and Martha Heintz.

COOPERATIVE RELATIONS — AN IMPORTANT PHASE

To guide and coordinate this program on a state level, a Soil Inventory Board of five members was selected representing the Natural Resources Commission, the Division of Lands and Soil, OAES, the OSU Agronomy Department, and SCS. The Board assumed responsibility for development of a complete soil inventory program in Ohio. The board meets regularly to discuss field and laboratory activities, and make decisions relative to the operation of the state program. The Soil Inventory Board makes decisions on the order in which counties are mapped. Factors affecting the order are the date of application by the county, the need for a survey based on selected criteria, and the monetary input by the county. The county commissioners are the usual body that submits a request to the Board. In 1955, the Soil Inventory Board members were Nick Holowaychuk, John Slipher, Garth Volk, Howe Morse, and John Ferguson.

The highly agricultural part of the state was the first part of Ohio to be mapped. The first county surveyed by the new Division was Paulding County beginning on 1 August 1952. It was followed closely by Clinton County on 1 September 1952, and three soil scientists were assigned to each county. The soil inventory of Ross County was already underway when the Division was formed. It was started by representatives of OAES and the USDA Division of Soil Survey, Bureau of Plant Industry which was transferred to SCS in November 1952. On 1 July 1953 the Ross County survey was transferred to the Division. During the summer of 1952, James Petro of the USDA and Dale Garner of the OAES resigned their positions and became employees of the Division.

After starting Paulding and Clinton Counties, the Division began developing cooperative relations between the agencies. First, the Memorandum of Understanding between OAES and ODNR was consumated. This memorandum provided for the cooperative endeavors of these two State agencies in the production of a basic inventory of Ohio's soil resources. Second, the State of Ohio and the USDA were tied together in a three-way Memorandum of Agreement between the OAES, ODNR, and SCS for the cooperative effort in making soil surveys. The major benefits to the state from this agreement have been the correlation and inspection work given by experienced correlators from SCS.

The cooperating agencies shared the major responsibilities. OSU Agronomy Department and OAES (now the Ohio Agricultural Research and Development Center of OSU) are primarily responsible for laboratory studies. The Division cooperates by furnishing labor, equipment, and technical assistance. Field work is done primarily by personnel of the Division and SCS (Fig. 13.2). Inspections and correlation of field work are jointly carried out by all cooperators with SCS taking leadership in final correlation.

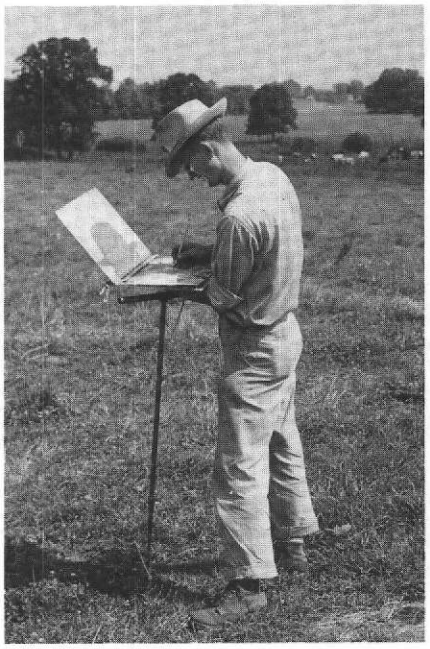

*Figure 13.2. **Alexander Ritchie** mapping soil in Champaign County in 1958. To inventory Ohio soils, soil scientists intensively investigate the soils by walking the land, observing surface features, and probing several feet deep with hand augers to examine characteristics of lower soil layers. Data are then recorded and boundary lines of soil types are drawn on aerial photographic base maps.*

Soil Investigations and Special Studies are jointly performed by the Division, SCS, and the OSU Agronomy Department. One of the principal achievements of the new Division was to publish nontechnical reports of a township, or groups of townships, while the survey of the county was in progress. The prototype was a report of Liberty Township, Clinton County, published in 1953. It was written primarily for landowners. Writing a substantive report in nontechnical language proved to be very difficult so the later reports became more technical and more substantive. Interim publications are edited and published by the Division. A final soil survey report of each county is published by USDA. Each of the cooperating agencies has full opportunity to cooperate in planning, execution, and publication of the results of all soil surveys conducted in the state.

Another distinguishing characteristic of the cooperative program was the great amount of field and laboratory study of Ohio's soils to aid in their characterization and interpretation. In 1954, James Evans was hired from the United States Bureau of Reclamation to head a new Special Studies Section (Fig. 13.3). The cooperation and work performed by the soil laboratories have added to the knowledge of Ohio soils. The State Highway Testing Laboratory, and the Soil Characterization Laboratory (Fig. 13.4) and the Soil Physics Laboratory at OSU were instrumental in making the Ohio soils program the best in the nation. The Soil Physics Laboratory headed by Dr. George Taylor performed technical measurements including volume, weight, porosity, permeability, and moisture holding capacity.

During 1953 and 1954, new soil surveys were underway in Wood, Ashtabula, and Greene Counties. A special survey was begun on the Massie Creek watershed in Greene County and also the Clear Creek watershed in Highland County. There was no cost to the counties on these early surveys except for providing field office space for the soil scientist. The field soil scientists were dedicated, hard-nosed, hardworking individuals and were accustomed to the tough rigors of the field. The same still holds true today.

Land judging was promoted and was a very important activity of the Division from its beginning in 1952. A scorecard for judging land and soil in Ohio was jointly developed by the Division, SCS, and OCES. The card is used by Ohio 4-H Camp, vocational agricultural groups, Future Farmers of America (FFA), teachers, and other groups throughout the state to encourage greater activity with understanding land and soil formations. The Division, with the assistance of SCS, conducted training and a land judging contest at the FFA Camp Muskingum in Carroll County for the FFA campers for several years. A State Land Judging Contest (Fig. 13.5) became a part of the annual state judging contests of vocational agriculture. The Division conducted these state contests with the support of the agencies involved in the Soil Inventory Board. This program has grown to involve more than 10,000 youths annually in land and soil judging in Ohio. Several revisions have been made to the original scorecard over the years. A.W. Short, who directed conservation education for the Division of Wildlife, gave excellent cooperation in this program.

OTHER EVENTS IN THE 1950'S

The 1950's were the years of growth, change, action, and advancement of the soil survey program. During 1954, the 83rd United States Congress passed the Watershed Protection and Flood Prevention Act (Public Law 83-566) to help meet the need of local people who are faced with problems on small watersheds (less than 250,000 acres). Governor Frank J. Lausche designated ODNR to assume responsibilities of approving all applications submitted by local organizations for federal assistance under the Act. The Division of Water was appointed by the Director as the lead agency within the Department. The Division of Lands and Soil was assigned the responsibility of collecting information on soil to be made available to the Division of Water. Field reconnaissance studies were made by Division personnel in cooperation with SCS to determine feasibility, needs, and local cooperation. Francis Baker was field supervisor of the program for the Division. On 6 July 1955, the basin-by-basin inventory of water resources was started by the Division of Water with the Division of Lands and Soil

*Figure 13.3. **James Evans** headed the new Special Studies Section of the Division of Lands and Soil in 1954. Here he operated the hydraulic soil probe truck as he retrieved a soil core.*

assembling soil information on each watershed. Upground storage of water, erosion hazards, productive capacity of each soil, and needed conservation measures were determined.

In 1956, Chief Ferguson proposed that a Public Service Section be established in the Division. During fiscal year 1955/1956, the one million-acres mark of mapped soils in Ohio was passed by the Division in the ten counties mapped or in process of being mapped. Personnel at this time included John W. Ferguson, Chief; G. Kenneth Dotson, Assistant Chief; Francis Baker, Water Resource Inventory Supervisor; James O. Evans, Head of Special Studies; T.R. Smith, Head of Public Service; John J. Scott; Thomas F. Boyce; Richard B. Jones; William J. Meyer; Alec R. Brock; James H. Petro; Dale Garner; Robert C. Roseler; Harlan R. Finney; Neil Reeder; Donald F. Rapparlie; Dalton H. Touvell; Noel Gordon; Richard L. Christman; and Martha Heintz, Secretary. In 1957, John Ferguson was selected for the position of Assistant Director of the Department. G. Kenneth Dotson (Fig. 13.6) was appointed Chief, a position he held until 1968, when he resigned to work with the United States Environmental Protection Agency at the Cincinnati office.

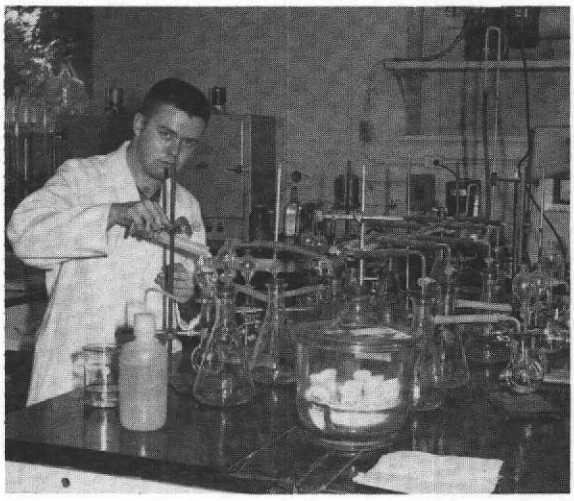

*Figure 13.4. **Frank Calhoun** of the Soil Characterization Laboratory at The Ohio State University performing measurements of physical and chemical properties of Ohio soils, circa 1960.*

In 1957, the 102nd General Assembly enacted House Bill 25 making the Division responsible for developing recommendations regarding water management on lands adjacent to construction projects of highways, railroads, pipelines, and other utilities. The Division was fortunate to employ a very capable engineer, Earl Haller, and assistant Carrol Dunfee to perform this task.

On 17-20 September 1957, the World Plowing Matches and Conservation Exhibit were held near Peebles in Adams County. The Division contributed exhibit material and provided guides for this world-class show. Also in 1957, headquarters was moved to 1564 West First Avenue in Grandview Heights (Fig. 13.7). During fiscal year 1959/1960, the two

Figure 13.5. Students of vocational agriculture participated in this land judging contest 13 May 1959. Land judging had always received strong support of the Division of Lands and Soil, and currently more than 10,000 students are involved annually in the State Land Judging Contest.

*Figure 13.6. **G. Kenneth Dotson**, second Chief of the Division of Lands and Soil, 1957-1968. Here he talked with students and teachers at the State Land Judging Contest on 5 May 1967.*

million-acre mark of soils mapped in Ohio was passed. Thus ended the 1950's epoch.

EVENTS OF THE 1960'S

As the Division entered the 1960's, the characteristics of the users of soil information changed. Although the agricultural community was still the dominant user, other professions were becoming aware of the importance of knowing more about soil, its weaknesses and its strengths.

The survey of Lorain County was the first in Ohio having a report with information for nonagricultural and agricultural users. The field party worked closely with and provided information to the Lorain County Regional Planning Commission. In March 1962, the first survey in the United States using Housing and Urban Development 701 Funds was started in Stark County. Jim Hickey, Director of the Stark County Regional Planning Commission, was a driving force in promoting use of soil survey information in the planning process (Fig. 13.8), not only in Stark County, but throughout Ohio. This was followed by a soil survey in 1964 for the Tri-County Regional Planning Commission of the Akron area.

The system of classifying soil was undergoing substantial changes beginning in the 1950's. The Division's soil scientists had to learn a new vocabulary. On 13 July 1951, Dr. Guy Smith, SCS Director of Soil Survey Investigations circulated an outline of the new soil classification system to be discussed at a conference on 17-21 September 1951. This was known as the "First Approximation." In June 1960, the 7th Approximation "brown book" of the classifying scheme was printed and sent to all survey offices and cooperators in soil survey. The 7th Approximation of the new classification system of soil was introduced by Dr. Smith at Madison, Wisconsin, during the International Meeting of the Soil Science Society in 1960. It would be 15 more years before the current version of the soil classification scheme, *Soil Taxonomy*, would be in the hands of the soil science community.

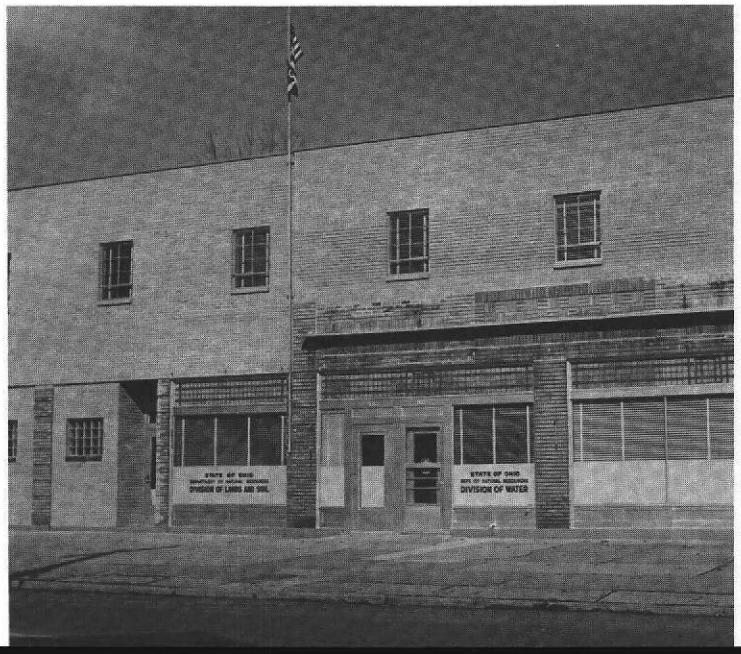

Figure 13.7. During the late 1950's and the 1960's, headquarters of the Division of Lands and Soil and the Division of Water were located at 1564 and 1562 West First Avenue in Grandview Heights.

*Figure 13.8. **Maynard Beery** weighing soil samples in a Stark County field to determine percentage of soil moisture, information relevant to wise land use planning. Photo by James Petro, 8 August 1967.*

Figure 13.9. Personnel of the Division of Lands and Soil in 1965. From left to right, seated: James Kerr, Dwain Waters, Betty Zacharias, Martha Heintz, Chief Kenneth Dotson, Richard Jones, John Thatcher. Standing: Donald Musgrave, James Petro, Gary Seitz, Kenneth Donaldson, Neil Reeder, Richard Christman, Alexander Ritchie, Victor Riemenschneider, James Ernst, Norris Williams, Dale Garner, Forrest Cunningham, Alec Brock, James Bauder, and Kenneth Powell.

The Water Resource Inventory that started in 1955 by the Division of Water and assisted by the Division of Lands and Soil was completed in June 1962. The very popular general soil map of the state, "Know Ohio's Soil Regions," was revised and printed.

The Little Hoover Commission, established in Ohio in 1962 by Governor James A. Rhodes, recommended that consideration be given to combining the Division of Lands and Soil with another Division within the Department to "promote greater efficiency." This idea was thoroughly studied and discussed and later rejected.

At the June 1961 meeting of ODNR Director Eagon's staff and all Division Chiefs, Irv Dickman, Chief of the Division of Reclamation, requested the Division of Lands and Soil to survey reclaimed strip mine soils to facilitate planning for better management. Director Eagon asked that this be given high priority. Sherman L. Frost of the Division of Water suggested that soil survey maps may be used for identification of floodplains. O.A. Alderman, Chief of the Division of Forestry, stated that "soil surveys facilitate the study of forest ecology." Dr. Roy M. Kottman of the OSU College of Agriculture and a member of the Natural Resources Commission always gave strong support to the soil survey program.

Requests had been received from 65 counties for soil surveys up to this time. More emphasis was being placed on developing reports having interpretations of soils relevant to urban users and those of the urban fringe. Planning agencies, tax assessors, realtors, bankers, engineers, developers, land appraisers, and agricultural economists were increasingly using the data.

Division personnel numbered 22 in 1965 (Fig. 13.9). In 1968, Ken Dotson resigned as Chief, and Richard B. Jones (Fig. 13.10), then Assistant Chief, was appointed Chief. Richard L. Christman, party leader in Stark County, was promoted to the position of Assistant Chief. Jones remained Chief until the Division was amalgamated into the Division of Soil and Water Conservation in 1982.

EVENTS OF THE 1970'S

The 1970's was the last full decade of life for the Division of Lands and Soil. The number of employees continued to remain in the range of 18 to 25 which included administrative and field personnel.

In 1972, soil information was beginning to be incorporated into land use capability plans. The plans were developed by the Department's Division of Planning for communities to use in their local planning and zoning efforts. Each plan contained a composite overlay map of soil data as well as land use, floodplain delineation, and geologic information. In developing the first community plans, it was soon apparent that only a few composite resource maps could be produced manually with the limited staff available. With the assistance of OSU, a series of computer programs were developed that permitted the encoding of soil information and other resource data into a computer format. The computer mapping program for resource data became

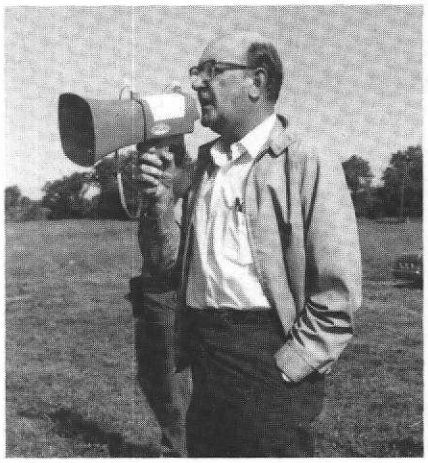

*Figure 13.10. **Richard B. Jones**, third Chief of the Division of Lands and Soil, 1968-82. Here he addressed an audience at a field day in 1970.*

known as the Ohio Capability Analysis Program (OCAP). In later years, OCAP was administered by the Division of Water, and in 1982 it formed part of the newly created Division of Soil and Water Conservation. Detailed soil survey information continues to form a primary and basic component of OCAP's mapping services. Soil survey information is used by OCAP to map prime farmlands and to help locate potential industrial, commercial, residential, and recreation areas for local communities. In addition, engineering characteristics of the soils, along with interpretative information, is produced in map form for use by local officials.

By the mid-1970's, over 60 percent of the lands of Ohio had been mapped. Special mapping and interpretations were provided for the Board on Unreclaimed Strip Mined Lands. The 25th anniversary of the Division occurred during 1977, and 70 percent of the state was now mapped. Operating expenses for fiscal year 1976-77 was $567,506. Cost-sharing revenues from county contributions were $25,303.

The Division, SCS, and the Ohio Agricultural Research and Development Center cooperated in the study of slip-prone lands in the eleven counties of the Ohio Valley Resource Conservation and Development Area. Field investigations and evaluations of slip-prone areas and associated soils were documented.

The land and soil judging program for vocational agriculture students continued as an important educational activity. Ken Powell, Head of the Public Service Section, continues to represent and lead the Division of Soil and Water Conservation in this program.

In 1978, 17.5 million of Ohio's 26.2 million acres of land were now in the mapped column. The projection to have all 88 counties completed by 1991 seemed an achievable goal.

EVENTS OF THE 1980'S AND THE END OF THE DIVISION OF LANDS AND SOIL

As we entered the 1980's, the end was in sight, not only for the Division but also for the once-over mapping of the entire state of Ohio. The surveys conducted prior to the activation of the Division in 1952 are not considered up-to-date surveys by present standards, and some of the counties that were the first to be mapped by the Division in the 1950's were beginning to reevaluate their surveys. Since 1952, considerable changes had developed in the soil classification system, in interpretation of soils information, in the type of physical and chemical data collected on soils, in the content and quality of the soil survey reports, and in the numerous special studies that had been conducted on soils throughout Ohio. Some counties began to contact the Soil Inventory Board to learn what they could do to bring their soil surveys up to modern standards. Thus began the modernization program of older surveys.

Before a commitment is made to a county requesting modernization of its soil survey, an in-depth evaluation of the older survey is made by a joint team of soil scientists representing the agencies participating in the Ohio Soil Survey Program. Paulding County, the first survey conducted by the Division, is currently undergoing an update to their survey.

The years swiftly rolled by and much was accomplished by a small Division in its nearly 30 years of life. Although the job of mapping the soils of the state was not completed as a Division, the work now continues as a Section within a new Division. What the Little Hoover Commission did not accomplish in 1962 became a reality on 15 March 1982 — just two weeks before the Division's 30th anniversary — when the Division of Lands and Soil was merged with the Division of Soil and Water Districts, the Ohio Capability Analysis Program, and the Remote Sensing Unit. The program goes forth now within the Division of Soil and Water Conservation (see Chapter 19). Upon the retirement of Richard L. Christman in January 1986, Alexander Ritchie, Jr., was promoted to the position of Administrator with primary responsibility to continue the soil survey program in Ohio.

Soil is one of our basic resources. To keep that resource from being diminished, we must give it our best care. To do that, we need to know its many varied characteristics. We must continue to gather information about our soil and publish that information in high quality surveys.